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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,438	10/16/2003	Masataka Kawabata	XA-9958	5784

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MILES & STOCKBRIDGE PC
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SUITE 500
MCLEAN, VA 22102-3833

EXAMINER	
SANDERS, KRIELLION ANTIONETTE	
ART UNIT	**PAPER NUMBER**
1714	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/23/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

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Office Action Summary	**Application No.** 10/685,438	**Applicant(s)** KAWABATA ET AL.	
	Examiner Kriellion A. Sanders	**Art Unit** 1714	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2006*.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.
4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-6* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a)☒ All b)☐ Some * c)☐ None of:
1.☒ Certified copies of the priority documents have been received.
2.☐ Certified copies of the priority documents have been received in Application No. _____.
3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's arguments with respect to claims 1-6 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

1. Claims 1- 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over EP 1 203 897 in view of Kitahara et al, US Patent No. 5,563,196 taken with Suzuki et al et al, US Patent No. 6,586,373 and Kakegawa et al, US Patent No. 5,889,081.

EP 1 203 897 discloses a fibrous base material with an optimum amount of friction modifying particles deposited on the surface of the fibrous base material. Preferably, the friction modifying particles are deposited on the fibrous base material during the process for making the fibrous base material. The t invention is especially useful with a primary layer comprising a fibrous base material comprising aramid fibres alone and/or combinations of less fibrillated aramid fibres, cotton fibres, carbon fibres, carbon particles and at least one filler material and, optionally, other ingredients. In certain examples, the less fibrillated aramid fibres create a porous fibrous base material. The carbon fibres provide good heat conduction such that the friction material has desired heat resistance. The carbon particles also provide the friction material with good friction characteristics such as a good or smooth "feel" in shift and essentially noise or "squawk" free operation of the brakes and clutches. The presence of a small relative amount of cotton fibres provides the friction material with desired "break-in" characteristics such that there is little or no shudder occurring during the initial use of the friction material. A secondary, or top, layer of friction modifying particles is deposited on the primary layer to form the fibrous base material. Various friction modifying particles are useful as the secondary layer on the fibrous base material. In particular, silica particles such as diatomaceous earth, celite®, celatom®, and/or silicon dioxide are especially useful. The surface friction modifying particles are present at about 0.2 to about 20%, by weight, and preferably about 2-10%, by weight, and most preferably about 3-5%, by weight, of the fibrous base material. The fibrous base material can be impregnated using different resin systems. In certain embodiments, it is useful to impregnate the fibrous based material with a phenolic resin or a modified phenolic-based resin. In certain embodiments, when a silicone resin is blended or mixed with a phenolic resin in compatible solvents and that silicone/phenolic resin blend is used to impregnate a fibrous base material of the present invention, an especially useful high energy friction material is formed. See paragraphs [0023] through [0026].

The EP reference differs from applicant's in that it is not specific to a wet friction material and it does not specify paper. However it does use similar types of material, such as aramid fibers and cotton as the base materials. Additionally the reference equates silica and diatom earth for formulating the base layers. The combined use of these equivalent components would have been obvious to one of ordinary skill in the art at the time of applicant's invention.

The remaining references document that the components of the EP reference are conventionally used in wet paper friction materials. Therefore, it would have been obvious to one of ordinary skill in the art at the time of applicant's invention to formulate the EP friction components into wet friction components. Nothing of an unobvious nature is seen by making such a variation.

The following references are relied upon for reasons of record:

Kitahara et al discloses a wet frictional material having superior heat resistance and durability, and having a large torque transmission capacity. Patentee further discloses a wet frictional material containing a fiber base material, a filler, a frictional adjustment agent and a thermosetting synthetic resin, wherein the thermosetting synthetic resin comprises a silicone resin. The wet frictional material of the patented invention may contain another thermosetting synthetic resin such as a modified phenol resin, or the like, in addition to the silicone resin of the invention. Kitahara et al teaches that the content of the resin is desirably selected so that the objects of the invention are attained.

Kitahara et al further discloses that various kinds of synthetic thermosetting resins have been used to formulate frictional materials. Phenol resins have been widely used for a variety of reasons such as heat resistance, abrasion resistance, handle-ability, price, etc. The phenol resin for use in the frictional material may be modified with various kinds of resins in order to improve the characteristics thereof. There are many kinds of useful modified phenol resins. For example, linear organo-polysiloxane may be bonded with novolac phenol resin so as to improve elasticity, tension propagation and tensile strength.

Suzuki et al discloses a wet friction material comprising a fiber base material, a filler and a binder, wherein the filler contains a disc-shaped diatomaceous earth; and wherein the filler also contains at least one other filler having a Mohs hardness of 8 to 9.5. The disc-shaped diatomaceous earth has an average diameter of 6 to 17mum and the binder of the invention contains a specific silicone resin binder.

The wet friction material according to the invention are manufactured by first, forming a paper body. This paper body may be acquired by drying a slurry acquired by dispersing fiber base material (including a natural pulp fiber such as wood pulp, an organic synthetic fiber such as an aramid fiber and an inorganic fiber such as glass), filler (such as diatomaceous earth) and a friction adjuster in water at a predetermined ratio according to a conventional method. The method, however is not particularly limited. Wet friction material according to the invention includes a fiber base material, a fiber and a binder. For the fiber base material, a natural pulp fiber such as wood pulp, an organic synthetic fiber, such as an aramid fiber, and an inorganic fiber such as glass and carbon can be used. The fiber base material in the first wet friction material preferably includes cotton.

It is desirable that for the filler, at least one of diatomaceous earth and filler having a Mohs hardness of 8 to 9.5 is used. It is also desirable that the diatomaceous earth used for filler is substantially disc-shaped. The superficial smoothness of the wet friction material is enhanced by using the disc-shaped diatomaceous earth. Contact with the frictional face of the subject material becomes satisfactory and as a result, the coefficient of friction is enhanced. Even if pressure is applied to the wet friction material, the wet friction material is seldom broken and it is presumed that the wet friction material is harder, compared with using granular diatomaceous earth. It is desirable that the average of the diameter of the disc-shaped diatomaceous earth is approximately 5 to 50 mum. The average diameter of disc-shaped diatomaceous earth is more preferably approximately 6 to 17 mum. The diatomaceous earth having an average diameter of 6 to 17 mum is used because it enhance the coefficient of frictions.

For the filler of 8 to 9.5 in Mohs hardness, silicon nitride, alumina, aluminum silicate and others are used. In the case wherein the above-mentioned fillers are separately used, and in the case wherein the above-mentioned fillers are arbitrarily combined and used, a satisfactory result can also be acquired and, the combination of disc-shaped diatomaceous earth and alumina is extremely excellent. The above-mentioned filler also functions as a friction adjuster.

In comparative Example 6, wet friction material including a paper body at 100% by weight and binder at 40% by weight is acquired by diluting undenatured ***resol***-type liquid phenol resin with ethanol, drying after the paper body A is impregnated with it, heating at 150 degree C for 30 minutes and hardening. A friction plate having a diameter of 130 mm and a thickness of 2.3 mm is acquired by a process similar to that set forth in example 6. Therefore, the use of the ***resol***-type liquid phenol resin as binder was known prior to applicant's invention. See col. 2, line 4 through col. 5, line 22.

Kakegawa et al discloses the use of a resol resin and a silicon particle to formulate binders for friction materials wherein the ratio of resol to silicone resin ranges from 99.99 to 70% of resol resin to 0.01 to 30.0 % of silicone resin. See claims 3 and 4 and Example 1.

2. It would have been obvious to one of ordinary skill in the art at the time of applicant's invention to utilize the specific organo-polysiloxane/phenol resins of Kitahara et al or Kakegawa et al at the weight ratios described by Kakegawa et al, to formulate wet friction materials such as

those disclosed by Suzuki et al et al, since Suzuki et al attributes the organo-polysiloxane/phenol resins with improving the elasticity, tension propagation and tensile strength of the wet friction materials.

Response to Arguments

Applicant's argument presented in the paper filed 2/21/2006 have been fully considered but they are not persuasive. Applicant argued that neither Kitahara et al or Suzuki disclose that the weight ratio between non-volatile components of the resol type phenol resin and the silicone resin is adjusted to a range of 95/5 to 85/15 or the advantages obtained from this ratio. This argument has not been found to be persuasive because Kitahara et al discloses that linear organo-polysiloxane may be bonded with novolac phenol resin so as to improve elasticity, tension propagation and tensile strength. While applicant would suggest that the present application supports patentability that is attributable to the ratio of the resol type phenol resin and the silicone resin being adjusted to within a range of 95/5 to 85/15, the data presented in the present specification does not clearly indicate unexpected results attributable to such ratios. For example comparative example 4 of the Suzuki et al. specification has a closely related coefficient of friction to the embodiment of the present invention. However, the comparative example does not include silica as does the present invention. Therefor the slight improvement in the coefficient of friction for the present compositions may be attributable to the inclusion of the silica.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kriellion A. Sanders whose telephone number is 571-272-1122. The examiner can normally be reached on Monday through Thursday 6:30-7:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Kriellion A. Sanders
Primary Examiner
Art Unit 1714